

WO 00/53786

1

PCT/EP00/01903

SEQUENCE LISTING

<110> ARTEMIS PHARMACEUTICALS GmbH

5 <120> Stable Recombinant Influenza Viruses Free of Helper
Viruses

<130> 000520wo/JH/ml

10 <140>
<141>

<160> 26

15 <170> PatentIn Ver. 2.1

<210> 1

<211> 4930

20 <212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: pHL2969

25

<400> 1

	cgtacgaagc	ttctagaggg	attggctgag	acgaaaaaca	tatgctagag	ggattggctg	60
	agacgaaaaa	catatgctag	agcggccgcc	accgcggttg	agctccagct	ttgtttccct	120
	ttagtgaggg	ttaattgcgc	gcaggcctag	ctaggtaaag	aaaaataccc	ttgtttctac	180
30	taataacccg	gcggcccaaa	atgccgactc	ggagcgaaag	atatacctcc	cccggggccg	240
	ggaggtcgcg	tcaccgacca	cgccgcccgc	ccaggcgacg	cgcgacacgg	acacctgtcc	300
	ccaaaaacgc	caccatcgca	gccacacacg	gagcgccccg	ggccctctgg	tcaaccccag	360
	gacacacgcg	ggagcagcgc	cgggcccggg	acgccctccc	ggccgcccgt	gccacacgca	420
	gggggcccgc	ccgtgtctcc	agagcgggag	ccggaagcat	tttcggccgg	cccctcctac	480
35	gaccgggaca	cacgagggac	cgaaggccgg	ccaggcgcca	cctctcgggc	cgcacgcgcg	540
	ctcagggagc	gctctccgac	tccgcacggg	gactcgccag	aaaggatcgt	gacctgcatt	600
	aatgaatcag	gggataacgc	aggaaagaac	atgtgagcaa	aaggccagca	aaaggccagg	660
	aaccgtaaaa	aggccgcggt	gctggcggtt	ttccataggc	tccgcccccc	tgacgagcat	720
	cacaaaaatc	gacgctcaag	tcagaggtgg	cgaaacccga	caggactata	aagataccag	780
40	gcgtttcccc	ctggaagctc	cctcgtgcgc	tctcctgttc	cgaccctgcc	gcttaccgga	840
	tacctgtccg	cctttctccc	ttcgggaagc	gtggcgcttt	ctcatagctc	acgctgtagg	900
	tatctcagtt	cgggtgtaggt	cgttcgctcc	aagctgggct	gtgtgcacga	acccccggt	960
	cagcccagacc	gctgcgcctt	atccggtaac	tatcgtcttg	agtccaaccc	gtaagacac	1020
	gacttatcgc	cactggcagc	agccactggg	aacaggatta	gcagagcgag	gtatgtaggc	1080
45	ggtgctacag	agttcttgaa	gtgggtggct	aactacggct	acactagaag	gacagtattt	1140
	ggtatctgcg	ctctgctgaa	gccagttacc	ttcggaaaaa	gagttggtag	ctcttgatcc	1200
	ggcaaacaaa	ccaccgctgg	tagcgggtgg	ttttttgttt	gcaagcagca	gattacgcgc	1260
	agaaaaaaag	gatctcaaga	agatcctttg	atcttttcta	cggggtctga	cgctcagtg	1320
	aacgaaaact	cacgttaagg	gatttttggt	atgagattat	caaaaaggat	cttcacctag	1380
50	atccttttaa	attaaaaatg	aagtttttaa	tcaatctaaa	gtatatatga	gtaaacttgg	1440
	tctgacagtt	accaatgctt	aatcagtgag	gcacctatct	cagcgatctg	tctatttcgt	1500
	tcattccatg	ttgcctgact	ccccgtcggt	tagataacta	cgatacggga	gggcttacca	1560
	tctggcccca	gtgctgcaat	gataccgcga	gacccacgct	caccggctcc	agatttatca	1620
	gcaataaacc	agccagccgg	aagggccgag	cgcagaagtg	gtcctgcaac	tttatccgcc	1680
55	tccatccagt	ctattaattg	ttgccgggaa	gctagagtaa	gtagtccgcc	agttaatagt	1740
	ttgcgcaacg	ttgttgccat	tgctacaggc	atcgtgggtg	cacgctcgtc	gtttggtagt	1800
	gcttcattca	gctccggttc	ccaacgatca	aggcgagtta	catgatcccc	catgttgtgc	1860
	aaaaaagcgg	ttagctcctt	cggtcctccg	atcgttgtca	gaagtaagtt	ggccgcagtg	1920
	ttatcactca	tggttatggc	agcactgcac	aattctctta	ctgtcatgcc	atccgtaaga	1980
60	tgcttttctg	tgactggtga	gtactcaacc	aagtcattct	gagaatagtg	tatgcggcga	2040
	ccgagttgct	cttgcgccgc	gtcaaacacg	gataataacc	cgccacatag	cagaacttta	2100

```

5  aaagtgtctca tcattggaaa acgttcttcg gggcgaaaac tctcaaggat cttaccgctg 2160
   ttgagatcca gttcgatgta acccactcgt gcacccaact gatcttcagc atcttttact 2220
   ttcaccagcg tttctgggtg agcaaaaaaca ggaaggcaaa atgccgcaaa aaagggaata 2280
   agggcgacac ggaaatgttg aatactcata ctcttccttt ttcaatatta ttgaagcatt 2340
   tatcaggggtt attgtctcat gagcggatag atatttgaat gtatttagaa aaataaacia 2400
   aagagtttgt agaaacgcaa aaagccatc cgtcaggatg gccttctgct taatttgatg 2460
   cctggcagtt tatggcgggc gtccctgccg ccaccctccg ggccgttgct tcgcaacggt 2520
   caaatccgct cccggcggat ttgtcctact caggagagcg ttcaccgaca aacaacagat 2580
   aaaacgaaaag gccagtcctt tcgactgagc ctttcgtttt atttgatgcc tggcagttcc 2640
10 ctactctcgc atggggagac cccacactac catcggcgct acggcggttc acttctgagt 2700
   tcggcatggg gtcaggtggg accaccgcgc tactgccgcc agggcaaattc tgttttatca 2760
   gaccgcttct gcgttctgat ttaatctgta tcaggctgaa aatcttctct catccgcaa 2820
   aacagaagct agcggccgat ccccaaaaaa aaaaaaaaaa gagtccagag 2880
   tggccccgcc gttccgcgcc gggggggggg gggggggggg acactttcgg acatctggtc 2940
15 gacctccagc atcgggggaa aaaaaaaaaa caaagtcttc cccggagtac tggctgacct 3000
   ccgaagtgtg gggggagtag aaacagggtg gataatcact cactgacgta cgttgagcaa 3060
   ctgactgaaa tgccttgagc aactgactga aatgcctgac gtcttttagca aaagcagggg 3120
   agataatcac tcaactgagt acatccacat cgtaccagga ttggctgaga cgaaaaacat 3180
   attgtaccag ggattggctg agacgaaaaa catattgtag gtaccaaatt gaacactcaa 3240
20 atcctgggtt tcgcccttgc ggcagtcac cccacaaatg cagacaaaat ttgtcttggg 3300
   catcatgctg tatcaaatgg caccaaagta aacacactca aaatttgctc aaaagggaaa 3420
   gtcaatgcaa cggaaacagt ggagcggaca aacatcccca ttaccggacc acctcaatgc 3480
   agaaccactg atcttggcca atgcggactg ataatcgaga gacgagaagg aaatgatgtt 3540
25 gaccaatttc tagaattttc agctgatcta gcattgcgac aaatcctcag aggatcaggt 3600
   tgttaccggt ggaagtgtgt taatgaagag tatagtggaa taaggaccaa cggaacaact 3660
   gggattgaca aagaaacaat gggattcaca tatgcagaaa tggagtggct cctgtcaaat 3720
   agtgcattga gaagatcagg gtcttcattc tatgcagaaa tggagtggct cctgtcaaat 3780
   acagacaatg cttctttccc acaaatgaca aaatcatata aaaacacagg gagagaatca 3840
   gctctgatag tctggggaat ccaccattca ggatcaacca ccgaacagac caaactatat 3900
30 gggagtggaa ataaactgat aacagtcggg agttccaaat atcatcaatc ttttgtgccg 3960
   agtccaggaa cagcaccgca gataaatggc cgggtccggac ggattgattt tcattgggtg 3960
   atcttggatc ccaatgatac agttactttt agtttcaatg gggctttcat agtccaaat 4020
   cgtgccagct tcttgagggt aaagtccatg gggatccaga gcgatgtgca ggttgatgct 4080
   aattgcgaag gggaatgcta ccacagtggg gggactataa caagcagatt gccttttcaa 4140
35 aacataaata gcagagcagt tggcaaatgc ccaagatatg taaaacagga aagtttatta 4200
   ttggcaactg ggatgaagaa cgttcccga ccttccaaaa aaaggaaaaa aagaggcctg 4260
   tttggtgcta tagcaggggt tattgaaaat gggtgggaag gtctggtcga cgggtggtag 4320
   ggtttcaggc atcagaatgc acaaggagaa ggaactgcag cagactacaa aagcacccaa 4380
   tcggcaattg atcagataac cggaaagtta aatagactca ttaagaaaac caaccagcaa 4440
40 tttgagctaa tagataatga attcactgaa gtggaaaagc agattggcaa ttttaattaac 4500
   tggaccaaa gactccatcac agaagtatgg tcttacaatg ctgaacttct tgtggcaatg 4560
   gaaaaccagc acactattga tttggctgat tcagagatga acaagctgta tgagcgagt 4620
   aggaacaat taagggaata tgctgaagag gatggcactg gttgctttga aatttttcat 4680
   aaatgtgacg atgattgtat ggctagtata aggaacaata cttatgatca cagcaaatat 4740
45 agagaagaag cgatgcaaaa tagaatacaa attgacccag tcaaattgag tagtggctac 4800
   aaagatgtga tacttttggt tagcttcggg gcatcatgct ttttgcttct tgccattgca 4860
   atgggccttg ttttcatatg tgtgaagaac ggaacatgc ggtgcactat atgcatttaa 4920
   agcttgcattg 4930

```

<210> 2

<211> 5811

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: pAM403

<400> 2

```

60 aattcctttt cctaatttaa atgaggactt aacctgtgga aatattttga tgtgggaagc 60
   tgttactgtt aaaactgagg ttattggggg aactgctatg ttaaacttgc attcagggac 120

```

	acaaaaaact	catgaaaatg	gtgctggaaa	accatttcaa	gggtcaaatt	ttcatttttt	180
	tgctgttggt	ggggaacctt	tggagctgca	gggtgtgtta	gcaaactaca	ggaccaaata	240
	tcctgtctcaa	actgtaaccc	caaaaaatgc	tacagttgac	agtcagcaga	tgaacactga	300
	ccacaaggct	gttttggata	aggataatgc	ttatccagtg	gagtgtctgg	ttcctgatcc	360
5	aagtaaaaaat	gaaaacacta	gatatttttg	aacctacaca	ggtggggaaa	atgtgcctcc	420
	tgttttgcac	attactaaca	cagcaaccac	agtgtcttct	gatgagcagg	gtgttggggc	480
	cttgtgcaaa	gctgacagct	tgtatgtttc	tgctgttgac	atttgtgggc	tgtttaccac	540
	cacttctgga	acacagcagt	ggaagggact	tcccagatat	tttaaaatta	cccttagaaa	600
	gcggtctgtg	aaaaacccct	acccaatttc	ctttttgtta	agtgaacctaa	ttaacaggag	660
10	gacacagagg	gtggatgggc	agcctatgat	tggaaatgtcc	tctcaagtag	aggaggttag	720
	ggtttatgag	gacacagagg	agcttctctg	ggatccagac	atgataagat	acattgatga	780
	gtttggacaa	accacaacta	gaatgcagtg	aaaaaaatgc	tttatttgtg	aaatttgtga	840
	tgctattgct	ttatttgtaa	ccattataag	ctgcaataaa	caagttaaca	acaacaattg	900
	cattcatttt	atgtttcagg	ttcaggggga	ggtgtgggag	gtttttttaa	gcaagtaaaa	960
15	cctctacaaa	tgtggtatgg	ctgattatga	tctctagtca	aggcactata	catcaaatat	1020
	tccttatttaa	cccctttaca	aattaaaaag	ctaaaggtag	acaatttttg	agcatagtta	1080
	ttaatagcag	acactctatg	cctgtgtgga	gtaagaaaaa	acagtatgtt	atgattataa	1140
	ctgttatgcc	tacttataaa	ggttacagaa	tatttttcca	taattttctt	gtagcagct	1200
20	gcagcttttt	cctttgtggt	gtaaatagca	aagcaagcaa	gagttctatt	actaaacaca	1260
	gcatgactca	aaaaacttag	caattctgaa	ggaaagtccct	tggggtcttc	tacctttctc	1320
	ttcttttttg	gaggagttag	atgttgagag	tcagcagtag	cctcatcatc	actagatggc	1380
	atttcttctg	agcaaaacag	gttttctctc	ttaaaggcat	tccaccactg	ctccatttca	1440
	tcagttccat	aggttggaa	ctaaaataca	caaacaatta	gaatcagtag	tttaacacat	1500
25	tatacactta	aaaattttat	atttacctta	gagctttaa	tctctgtagg	tagtttgtcc	1560
	aattatgtca	caccacagaa	gtaagggtcc	ttcacaaga	tccgggacca	aagcggccat	1620
	cgtgcctccc	cactcctgca	gttcgggggc	atggatgcgc	ggatagccgc	tgctggttcc	1680
	ctggatgccg	acggatttgc	actgccggta	gaactccgcg	aggctcgtcca	gcctcaggca	1740
	gcagctgaac	caactcgcga	ggggatcgag	cccggggtgg	gcgaagaact	ccagctagag	1800
30	atccccgcgc	tggagatca	tccagccggc	gtcccggaaa	acgattccga	agcccaacct	1860
	ttcatagaag	gcggcggtgg	aatcgaaatc	tcgtgatggc	agggttggcg	tcgcttggtc	1920
	ggtcatttctg	atgaattcga	gctcgggtacc	cggggatcct	ctagaggcat	ttcagtttcg	1980
	tcctcacgga	ctcatcagag	ttgtcattt	cgaaccccag	agtcgccgctc	agaagaactc	2040
	gtcaagaagg	cgatagaagg	cgatgcgctg	cgaatcggga	gcggcgatag	cgtaaagcac	2100
	gaggaagcgg	tcagcccat	cgccgcgaag	ctcttcagca	atatcacggg	tagccaacgc	2160
35	tatgtcctga	tagcgggtccg	ccacacccag	ccggccacag	tcgatgaatc	cagaaaagcg	2220
	gccattttcc	accatgatat	tcggcaagca	ggcatcgcga	tgggtcacga	cgagatcctc	2280
	gccgtcgggc	atgcgcgcct	tgagcctggc	gaacagttcg	gctggcgcgga	gcccctgatg	2340
	ctcttcgtcc	agatcatcct	gatcgacaag	accggcttcc	atccgagtac	gtgctcgctc	2400
	gatgcgatgt	ttcgcttggg	ggtcgaatgg	gcaggtagcc	ggatcaagcg	tatgcagccg	2460
40	ccgcatttga	tcagccatga	tggatacttt	ctcggcagga	gcaaggtgag	atgacaggag	2520
	atcctgcccc	ggcacttcgc	ccaatagcag	ccagtccctt	cccgccttcag	tgacaacgct	2580
	gagcacagct	gcgcaaggaa	cgcccgctcg	ggccagccac	gatagccgcg	ctgcctcgctc	2640
	ctgcagttca	ttcagggcac	cggacaggtc	ggtcttgaca	aaaagaaccg	ggcgcccttg	2700
	cgctgacagc	cggaacacgg	cggcatcaga	gcagccgatt	gtctgttgtg	ccagctcata	2760
45	gccgaatagc	ctctccaccc	aagcggcccg	agaacctgcg	tgcaatccat	cttgttcaat	2820
	catcgaaaac	gatcctcatc	ctgtctcttg	atcatatctt	gatccctctg	gccatcagat	2880
	ccttggcggc	aagaaagcca	tccagttttac	tttgaggggc	ttcccaacct	taccagaggg	2940
	cgccccagct	ggcaattccg	gttcgcttgc	tgtccataaa	accgcccagt	ctagctatcg	3000
	ccatgtaagc	ccactgcaag	ctacctgctt	tctcttttgcg	cttgcggtttt	cccttgtcca	3060
50	gatagcccag	tagctgacat	tcacccgggg	tcagcacctg	ttctgcggac	tggcttttcta	3120
	cgtgttccgc	ttccttttagc	agcccttgcg	ccctgagtgc	ttgcggcagc	gtgaagcttt	3180
	ttgcaaaaagc	ctaggcctcc	aaaaaagcct	cctcactact	tctggaatag	ctcagaggcc	3240
	gaggcggcct	cggcctctgc	ataaataaaa	aaaatttagtc	agccatgggg	cggagaatgg	3300
55	gcggaactgg	gcggagttag	ggcggggatg	ggcgaggtta	ggggcgggac	tatggttgct	3360
	gactaattga	gatgcattgct	ttgcatactt	ctgcctgctg	gggagcctgg	ggactttcca	3420
	cacctggttg	ctgactaatt	gagatgcatg	ctttgcatac	ttctgcctgc	tggggagcct	3480
	ggggactttc	cacaccctaa	ctgacacaca	ttccacagct	gcctcgcgcg	tttcggtgat	3540
	gacggtgaaa	acctctgaca	catgcagctc	ccggagacgg	tcacagcttg	tctgtaagcg	3600
	gatgccggga	gcagacaagc	ccgtcagggc	gcgtcagcgg	gtgttggcgg	gtgtcggggc	3660
60	gcagccatga	cccagtcacg	tagcgatagc	ggagtgtata	ctggcttaac	tatgcggcat	3720
	cagagcagat	tgtactgaga	gtgcaccata	tgcggtgtga	aataccgcac	agatgcgtaa	3780

	ggagaaaata	ccgcatcagg	cgtctttccg	cttcctcget	cactgactcg	ctgcgctcgg	3840
	tcggttcggct	gcggcgagcg	gtatcagctc	actcaaaggc	ggtaatacgg	ttatccacag	3900
	aatcagggga	taacgcagga	aagaacatgt	gagcaaaaag	ccagcaaaaag	gccaggaacc	3960
	gtaaaaaggc	cgcgttgctg	gcgtttttcc	ataggctccg	ccccctgac	gagcatcaca	4020
5	aaaatcgacg	ctcaagtcag	aggtggcgaa	acccgacagg	actataaaga	taccaggcgt	4080
	ttccccctgg	aagctccctc	gtgcgctctc	ctgttccgac	cctgccgctt	accggatacc	4140
	tgtccgcctt	tctcccttcg	ggaagcgtgg	cgctttctca	tagctcacgc	tgtaggtatc	4200
	tcagttcggg	gtaggtcggt	cgctccaagc	tgggctgtgt	gcacgaaccc	cccgttcagc	4260
	ccgaccgctg	cgccttatcc	ggtaactatc	gtcttgagtc	caaccgggta	agacacgact	4320
10	tatcgccact	ggcagcagcc	actggtaaca	ggattagcag	agcgagggtat	gtaggcgggtg	4380
	ctacagagtt	cttgaagtgg	tggcctaact	acggctacac	tagaaggaca	gtatttggtg	4440
	tctgcgctct	gctgaagcca	gttaccttcg	gaaaaagagt	tggtagctct	tgatccggca	4500
	aacaaaccac	cgtggttagc	ggtaggtttt	ttgtttgcaa	gcagcagatt	acgcgcagaa	4560
	aaaaaggatc	tcaagaagat	cctttgatct	tttctacggg	gtctgacgct	cagtggaaacg	4620
15	aaaactcacg	ttaagggatt	ttggtcatga	gattatcaaa	aaggatcttc	acctagatcc	4680
	ttttaaatta	aaaatgaagt	tttaaataca	tctaaagtat	atatgagtaa	acttggtctg	4740
	acagttacca	atgcttaatc	agtgaggcac	ctatctcagc	gatctgtcta	tttcgttcat	4800
	ccatagttgc	ctgactcccc	gtcgtgtaga	taactacgat	acgggagggc	ttaccatctg	4860
	gccccagtg	tgcaatgata	ccgcgagacc	cacgctcacc	ggctccagat	ttatcagcaa	4920
20	taaaccagcc	agccggaagg	gccgagcgca	gaagtgggtc	tgcaacttta	tccgcctcca	4980
	tccagtctat	taattgttgc	cgggaagcta	gagtaagtag	ttcgccagtt	aatagtttgc	5040
	gcaacgttgt	tgccattgct	gcaggcatcg	tggtgtcacg	ctcgtcgttt	ggtagggctt	5100
	cattcagctc	cggttcccaa	cgatcaaggc	gagttacatg	atcccccatg	ttgtgcaaaa	5160
	aagcggttag	ctccttcggt	cctccgatcg	ttgtcagaag	taagttggcc	gcagtgttat	5220
25	cactcatggt	tatggcagca	ctgcataaatt	ctcttactgt	catgccatcc	gtaagatgct	5280
	tttctgtgac	tggtgagtac	tcaaccaagt	cattctgaga	atagtgtatg	cggcgaccga	5340
	gttgctcttg	cccggcgctc	acacgggata	ataccgcgcc	acatagcaga	actttaaaaag	5400
	tgctcatcat	tggaaaacgt	tcttcggggc	gaaaactctc	aaggatctta	ccgctgttga	5460
	gatccagttc	gatgtaaccc	actcgtgcac	ccaactgatc	ttcagcatct	tttactttca	5520
30	ccagcgtttc	tgggtgagca	aaaacaggaa	ggcaaaaatgc	cgcaaaaaag	ggaataaggg	5580
	cgacacggaa	atggtgaata	ctcatactct	tcctttttca	atattattga	agcattttac	5640
	agggttattg	tctcatgagc	ggatacatct	ttgaatgtat	ttagaaaaat	aaacaaatag	5700
	gggttccgcg	cacattttcc	cgaaaagtgc	cacctgacgt	ctaagaaacc	attattatca	5760
	tgacattaac	ctataaaaaat	aggcgtatca	cgaggccctt	tcgtcttcaa	g	5811

<210> 3

<211> 2005

<212> DNA

40 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: vHM41

45 <400> 3

	agtagaaaca	agggatattt	tctttaccta	gctaggcctg	cgcgcaatta	accctcacta	60
	aagggaacaa	aagctggagc	tccaccgcgg	tggcgccgcg	tctagcatat	gtttttcgtc	120
	tcagccaatc	cctctagcat	atgttttttcg	tctcagccaa	tccctctaga	agcttcgtac	180
	gcatgcaagc	tttaaatgca	tatagtgcac	cgcattgttc	cggttcttcac	acatatgaaa	240
50	acaaggccca	ttgcaatggc	aagaagcaaa	aagcatgatg	ccccgaagct	aaaccaaagt	300
	atcacatctt	tgtagccact	actcaatttg	actgggtcaa	tttgtattct	attttgcac	360
	gcttcttctc	tgtatttgct	gtgatcataa	gtattgttcc	ttatactagc	catacaatca	420
	tcgtcacatt	tatgaaaaat	ttcaaagcaa	ccagtgccat	cctcttcagc	attttccctt	480
	aattgtttcc	tactcgtctc	atacagcttg	ttcatctctg	aatcagccaa	atcaatagtg	540
55	tgctgggttt	ccattggccac	aagaagtcca	gcattgttaag	accatacttc	tgtgatggag	600
	tctttgggtc	agttaattaa	attgccaatc	tgtttttcca	cttcagtga	ttcattatct	660
	attagctcaa	attgctgggt	ggttttctta	atgagtctat	ttacttttcc	ggttatctga	720
	tcaattggcg	attgggtgct	ttgttagtct	gctgcagttc	cttctccttg	tgcattctga	780
	tgctgaaac	cgtaccaccc	gtcgacagaa	ccttcccaac	catttttcaat	aaacctgct	840
60	atagcaccaa	acaggcctct	ttttttcctt	tttttggaag	gttcgggaac	gttcttcac	900
	ccagttgcca	ataataaact	ttcctgtttt	acatatcttg	ggcatttgcc	aactgctctg	960

```

ctatttatgt tttgaaaagg caatctgctt gttatagtc ctcactgtg gtagcattcc 1020
ccttcgcaat tagcatcaac ctgcacatcg ctctggatcc ccatggactt tcccctcaag 1080
aagctggcac gatttggagc tatgaaagcc ccattgaaac taaaagtaac tgtatcattg 1140
ggatccaaga tcaaccaatg aaaatcaatc cgctcggacc ggccatttat ctgcggtcgt 1200
5 gttcctggac tcggcacaaa agattgatga tatttggaa tcccgaactgt tatcagttta 1260
tttccactcc catatagttt ggtctgttcg gtggttgatc ctgaatggtg gattccccag 1320
actatcagag ctgattctct ccctgtgttt ttgtatgatt ttgtcatttg tgggaaagaa 1380
gcattgtctg tatttgacag gagccactcc atttctgcat agaatagaaga ccctgatctt 1440
ctacatgcac tagttgttcc gttggtcctt atttccactat atgtgaatcc cattgtttct 1500
10 ttgtcaatcc cacctgatcc tctgaggatt tgctcgcaatg cctcttcatt aacaaacttc 1560
cccgggtaac aaacatcatt tccttctcgt ctctcgatta ttagatcagc tgaaaattct 1620
agaaattggt cgcattgagg tggctcggta atggctcccta acagtcgcga ttggccaaga 1680
tcagtggttc ttttcccttt tgagcaaatt ttggggatgt ttgtccgctc cactgtttcc 1740
gttgcatgga caacttctac tcctctctca gtgagtgtgt ttactttggt gccatttgat 1800
15 acagcatgat gtccaagaca aattttgtct gcatttgtgg ggatgactgc cgcaaggcg 1860
aaaaccagga tttgagtgtt cattttggta cctacaatat gtttttcgtc tcagccaatc 1920
cctggtacaa tatgtttttc gtctcagcca atcctggtac gatgtggatg tcactcagtg 1980
agtgattatc taccctgctt ttgct 2005

```

20

```

<210> 4
<211> 1146
<212> DNA
<213> Artificial Sequence

```

25

```

<220>
<223> Description of Artificial Sequence: vHM81

```

```

<400> 4

```

```

30 agtagaaaca agggatatttt tctttaccta gctaggcctg cgcgcaatta accctcacta 60
aagggaacaa aagctggagc tccaccgagg tggcgccgc tctagcatat gtttttcgtc 120
tcagccaatc cctctagcat atgtttttcg tctcagccaa tccctctaga agcttcgtac 180
gcatgcttaa ataagctgaa acgagaaagt tcttatctct tgctccactt caagcggtag 240
35 ttgtaaggct tgcataaatg ttatttgttc aaaactatct tctgttatct tcaatctatg 300
tctcacttct tcaattaacc atcttatttc ttcaaatttc tgactcaatt gttctcgcca 360
ttttccgttt ctgctttgga gggagtggag gtcccccat ctcattactg cttctccaag 420
cgaatctctg tatagtttca gagactcgaa ctgtgttatc attccattca agtcctccga 480
tgaggacccc aattgcattt ttgacatcct catcagtatg tccctggaaga gaaggcaatg 540
40 gtgaaatttc gccgacaatt gctccctcat cgggttaaagc ccttaatagt atgagagttt 600
ccagccgacg gaaaatcaca ctgaagtttg ctttcagtat gatgttcttc cccatgatcg 660
cctggtccat tctgatgcaa agggagcctg ccactttctg tttgggcatg agcatgaacc 720
agtcccttga catctcttca agagtcagt cagttaggta gcgtgtagca ggtacagagg 780
caatggtcat ttaagtgcc tcatcggatt cgctcctccag aatccgctcc actatctgct 840
45 ttccaacacg agtagctgtg tcgatgtcca gaccaagagt gctgcctctt cccctcaggg 900
acttctgatc tcggcgaaagt cgggtcaagga atggggcatc acccatttct tgggtctgcaa 960
atcgtttgcg gacatgccaa agaaagcagt ctacctgaaa gcttgacaca gtgttggaat 1020
ccattatggt acctacaata tgtttttcgt ctcagccaat ccctggtaca atatgttttt 1080
cgtctcagcc aatcctggta cgatgtggat gtcactcagt gagtgattat ctaccctgct 1140
50 tttgct 1146

```

```

<210> 5
<211> 5860
<212> DNA
55 <213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: pAM424

```

```

60 <400> 5
catcgattgg ctgactgatg agtccgtgag gacgaaacga aaaacatatt gtagagctcg 60

```

	aattcatcga	aatgaccgac	caagcgacgc	ccaacctgcc	atcacgagat	ttcgattcca	120
	ccgccgcctt	ctatgaaagg	ttgggcttcg	gaatcgtttt	ccgggacgcc	ggctggatga	180
	tcctccagcg	cggggatctc	atgctggagt	tcttcgcccc	ccccgggctc	gatccccctc	240
	cgagttgggt	cagctgctgc	ctgaggctgg	acgacctcgc	ggagttctac	cggcagtgca	300
5	aatccgtcgg	catccaggaa	accagcagcg	gctatccgcg	catccatgcc	cccgaactgc	360
	aggagtgggg	aggcacgatg	gccgctttgg	tcccggatct	ttgtgaagga	accttacttc	420
	tgtgggtgtga	cataattgga	caaactacct	acagagattt	aaagctctaa	ggtaaataata	480
	aaatttttaa	gtgtataatg	tggttaaacta	ctgattctaa	ttgtttgtgt	atttttagatt	540
	ccaacctatg	gaactgatga	atggggagcag	tggtggaatg	cctttaatga	ggaaaacctg	600
10	ttttgctcag	aagaaatgcc	atctagtgat	gatgaggcta	ctgctgactc	tcaacattct	660
	actcctccaa	aaaagaagag	aaaggtagaa	gaccccaagg	actttccttc	agaattgcta	720
	agttttttga	gtcatgctgt	gttttagtaat	agaactcttg	cttgctttgc	tatttacacc	780
	acaaaggaaa	aagctgcact	gctatacaag	aaaattatgg	aaaaatattc	tgtaaccttt	840
	ataagtaggc	ataacagtta	taatcataac	atactgtttt	ttcttactcc	acacaggcat	900
15	agagtgtctg	ctattaataa	ctatgctcaa	aaattgtgta	ccttttagctt	tttaatttgt	960
	aaaggggtta	ataaggaata	tttgatgtat	agtgccttga	ctagagatca	taatcagcca	1020
	taccacattt	gtagaggttt	tacttgcttt	aaaaaacctc	ccacacctcc	ccctgaacct	1080
	gaaacataaa	atgaatgcaa	ttgttggtgt	taacttgttt	attgcagctt	ataatgggtta	1140
	caaataaagc	aatagcatca	caaatttcac	aaataaagca	tttttttcac	tgcatctctag	1200
20	ttgtgggttg	tccaaactca	tcaatgtatc	ttatcatgtc	tggtatcccca	ggaagctcct	1260
	ctgtgtcctc	ataaacccta	acctcctcta	cttgagagga	cattccaatc	ataggctgcc	1320
	catccaccct	ctgtgtcctc	ctgttaatta	ggtcacttaa	caaaaaggaa	attgggtagg	1380
	ggtttttcac	agaccgcttt	ctaagggtaa	ttttaaaaata	tctgggaagt	cccttccact	1440
	gctgtgttcc	agaagtgttg	gtaaacagcc	cacaatgtgc	aacagcagaa	acatacaagc	1500
25	tgtcagcttt	gcacaaggcc	ccaacaccct	gctcatcaag	aagcactgtg	gttgctgtgt	1560
	tagtaatgtg	caaaaacagga	ggcacatttt	ccccacctgt	gtaggttcca	aaatatctag	1620
	tgttttcatt	tttacttgga	tcaggaaccc	agcactccac	tggtataagca	ttatccttat	1680
	ccaaaacagc	cttggtgtca	gtgttcatct	gctgactgtc	aactgtagca	ttttttgggg	1740
	ttacagtttg	agcaggatat	ttgggtcctgt	agtttgctaa	cacacctgtc	agctccaaag	1800
30	gttccccacc	aacagcaaaa	aatgaaaat	ttgaccttg	aatgggtttt	cagcaccat	1860
	tttcatgagt	tttttgtgtc	cctgaatgca	agtttaacat	agcagttacc	ccaataacct	1920
	cagttttaac	agtaacagct	tcccacatca	aaatatttcc	acaggttaag	tcctcattta	1980
	aattaggcaa	aggaattctt	gaagacgaaa	gggcctcgtg	atacgcctat	ttttataggt	2040
	taatgtcatg	ataataatgg	tttcttagac	gtcagggtggc	acttttcggg	gaaatgtgcg	2100
35	cggaaaccct	atttgtttat	ttttctaaat	acattcaaat	atgtatccgc	tcatgagaca	2160
	ataaccctga	taaatgcttc	aataatattg	aaaaagggaag	agtatgagta	ttcaacattt	2220
	ccgtgtcgcc	cttatccct	tttttgcgcc	atthttgcct	cctgtttttg	ctcaccaga	2280
	aacgctgggtg	aaagtaaaag	atgctgaaga	tcagttgggt	gcacgagtgg	gttacatcga	2340
	actggatctc	aacagcggta	agatccttga	gagttttcgc	cccgaagaac	gttttccaat	2400
40	gatgagcact	tttaaagtgc	tgctatgtgg	cgcggtatta	tcccgtgttg	acgccgggca	2460
	agagcaactc	ggtcgcccga	tacactattc	tcagaatgac	ttggttgagt	actcaccagt	2520
	cacagaaaag	catcttacgg	atggcatgac	agtaagagaa	ttatgcagtg	ctgccataac	2580
	catgagtgat	aacactgcgg	ccaacttact	tctgacaacg	atcggaggac	cgaaggagct	2640
	aaccgctttt	ttgcacaaca	tgggggatca	tgtaactcgc	cttgatcggt	gggaaccgga	2700
45	gctgaatgaa	gccataccaa	acgacgagcg	tgacaccacg	atgcctgcag	caatggcaac	2760
	aacgttgccg	aaactattaa	ctggcgaact	acttactcta	gcttcccggc	aacaattaat	2820
	agactggatg	gaggcggata	aagttgcagg	accacttctg	cgctcggccc	ctcgggctgg	2880
	ctgggtttatt	gctgataaat	ctggagccgg	tgagcgtggg	tctcgcggta	tcattgcagc	2940
	actggggcca	gatggtaagc	cctcccgtat	cgtagttatc	tacacgacgg	ggagtcaggc	3000
50	aactatggat	gaacgaaata	gacagatcgc	tgagataggt	gcctcactga	ttaagcattg	3060
	gtaactgtca	gaccaagtgt	actcatatat	acttttagatt	gattttaaac	ttcattttta	3120
	attttaaagg	atctaggtga	agatcctttt	tgataatctc	atgaccaaaa	tcccttaacg	3180
	tgagttttcg	ttccactgag	cgtcagaccc	cgtagaaaag	atcaaaggat	cttcttgaga	3240
	tccttttttt	ctgcgcgtaa	tctgctgctt	gcaaacaaaa	aaaccaccgc	taccagcggt	3300
55	ggttttgttg	ccggatcaag	agctaccaac	tctttttccg	aaggtaactg	gcttcagcag	3360
	agcgcagata	ccaaataactg	tccttctagt	gtagccgtag	ttaggccacc	acttcaagaa	3420
	ctctgtagca	ccgcctacat	acctcgctct	gctaattctg	ttaccagtgg	ctgctgccag	3480
	tggcgataag	tctgttcta	ccgggttgga	ctcaagacga	tagttaccgg	ataaggcgca	3540
	gcggtcgggc	tgaacggggg	gttcgtgcac	acagcccagc	ttggagcgaa	cgacctacac	3600
60	cgaactgaga	tacctacagc	gtgagctatg	agaaagcgcc	acgcttcccg	aaggggagaaa	3660
	ggcggacagg	tatccggtaa	gcggcagggg	cggaaacagga	gagcgcacga	gggagcttcc	3720

	agggggaaac	gcctgggtatc	tttatagttcc	tgtcggggttt	cgccacctct	gacttgagcg	3780
	tcgattttttg	tgatgctcgt	caggggggag	gagcctatgg	aaaaacgcca	gcaacgcggc	3840
	ctttttacgg	ttcctggcct	tttgctggcc	ttttgctcac	atgttctttc	ctgcgttatc	3900
	ccctgattct	gtggataaacc	gtattaccgc	ctttgagtga	gctgataccg	ctcgccgcag	3960
5	ccgaacgacc	gagcgcagcg	agtcagttag	cgaggaagcg	gaagagcgcc	tgatgcggta	4020
	ttttctcctt	acgcatctgt	gcggtatttc	acaccgcata	tggtgcactc	tcagtacaat	4080
	ctgctctgat	gccgcatagt	taagccagta	tacactccgc	tatcgctacg	tgactgggtc	4140
	atggctgcgc	cccgcacacc	gccaacacc	gctgacgcgc	cctgacgggc	ttgtctgctc	4200
	ccggcatccg	cttacagaca	agctgtgacc	gtctccggga	gctgcatgtg	tcagagggtt	4260
10	tcaccgtcat	caccgaaacg	cgcgaggcag	ctgtggaatg	tgtgtcagtt	agggtgtgga	4320
	aagtccccag	gctccccagc	aggcagaagt	atgcaaagca	tgcattctcaa	ttagttagca	4380
	accaggtgtg	gaaagtcccc	aggctcccca	gcaggcagaa	gtatgcaaag	catgcatctc	4440
	aattagtcag	caaccatagt	cccgccccta	actccgcccc	tcccgcacct	aactccgccc	4500
	agttccgccc	attctccgcc	ccatggctga	ctaatttttt	ttatttatgc	agaggccgag	4560
15	gccgcctcgg	cctctgagct	attccagaag	tagtgaggag	gcttttttgg	aggcctaggc	4620
	ttttgcaaaa	agcttcacgc	tgccgcaagc	actcagggcg	caagggctgc	taaaggaagc	4680
	ggaacacgta	gaaagccagt	ccgcagaaaac	ggtgctgacc	ccggatgaat	gtcagctact	4740
	gggctatctg	gacaagggaa	aacgcaagcg	caaagagaaa	gcaggtagct	tgcatgtggc	4800
	ttacatggcg	atagctagac	tgggcgggtt	tatggacagc	aagcgaaccg	gaattgccag	4860
20	ctggggcgcc	ctctggtaag	gttggaagc	cctgcaaagt	aaactggatg	gctttcttgc	4920
	cgccaaggat	ctgatggcgc	aggggatcaa	gatctgatca	agagacagga	tgaggatcgt	4980
	ttcgcatgat	tgaacaagat	ggattgcacg	caggttctcc	ggccgcttgg	gtggagaggc	5040
	tattcggtta	tgactgggca	caacagacaa	tcggctgctc	tgatgccgcc	gtgttccggc	5100
	tgtcagcgca	ggggcgcccc	gttctttttg	tcaagaccga	cctgtccggg	gccctgaatg	5160
25	aactgcagga	cgaggcagcg	cggtatcgt	ggctggccac	gacgggcgtt	ccttgccgag	5220
	ctgtgctcga	cgttgtcact	gaagcgggaa	gggactggct	gctattgggc	gaagtgccgg	5280
	gcaggatctc	ctgtcatct	caccttgctc	ctgccgagaa	agtatccatc	atggctgatg	5340
	caatgcggcg	gctgcatacg	cttgatccgg	ctacctgccc	attcgaccac	caagcgaaac	5400
	atcgcatcga	gcgagcacgt	actcggtatg	aagccgggtc	tgctgatcag	gatgatctgg	5460
30	acgaagagca	tcaggggctc	gcgccagccg	aactgttcgc	caggctcaag	gcgcgcatgc	5520
	ccgacggcga	ggatctcgtc	gtgacccatg	gcgatgcctg	cttgccgaat	atcatgggtg	5580
	aaaatggccg	cttttctgga	ttcatcgact	gtggccggct	gggtgtggcg	gaccgctatc	5640
	aggacatagc	gttggtacc	cgtgatattg	ctgaagagct	tggcggcgaa	tgggctgacc	5700
	gcttctcgt	gctttacgg	atcgccgctc	ccgattcgca	gcgcataccc	ttctatcgcc	5760
35	ttcttgacga	gttcttctga	gcgggactct	ggggttcgaa	tcctaccagg	gattggctga	5820
	ctgatgagtc	cgtgaggacg	aaacgaaaaa	catatggtac			5860

<210> 6

40 <211> 4610

<212> DNA

<213> Artificial Sequence

<220>

45 <223> Description of Artificial Sequence: pHL2507

<400> 6

	gaggcatttc	agtcagttgc	tcaaggtacc	aaaatgaaca	ctcaaatacct	ggtttttcgcc	60
	cttgccggcag	tcatccccac	aaatgcagac	aaaatttgct	ttggacatca	tgctgtatca	120
50	aatggcacca	aagtaaacc	actcactgag	agaggagttag	aagttgtcaa	tgcaacggaa	180
	acagtggagc	ggacaaacat	cccaaaatt	tgctcaaaag	ggaaaagaac	cactgatctt	240
	ggccaatgcg	gactgttagg	gaccattacc	gaccacctc	aatgcgacca	atttctagaa	300
	ttttcagctg	atctaataat	cgagagacga	gaaggaaatg	atgtttgtta	cccgggggaag	360
	tttggttaatg	aagaggcatt	gcgacaaatc	ctcagaggat	caggtgggat	tgacaaagaa	420
55	acaatgggat	tcacatatag	tggaaataag	accaacggaa	caactagtgc	atgtagaaga	480
	tcagggtctt	cattctatgc	agaaatggag	tggctcctgt	caaatacaga	caatgcttct	540
	ttcccacaaa	tgacaaaatc	atacaaaaac	acaggagagag	aatcagctct	gatagtctgg	600
	ggaatccacc	attcaggatc	aaccaccgaa	cagaccaaac	tatatgggag	tggaaataaa	660
	ctgataacag	tcgggagttc	caaatatcat	caatctttttg	tgccgagtc	aggaacacga	720
60	ccgcagataa	atggccggtc	caggcgatt	gatttttcatt	ggttgatctt	ggatcccaat	780
	gatacagtta	cttttagttt	caatggggct	ttcatagctc	caaatacgtc	cagcttcttg	840

	aggggaaagt	ccatggggat	ccagagcgat	gtgcaggttg	atgctaattg	cgaaggggaa	900
	tgctaccaca	gtggaggagc	tataacaagc	agattgcctt	ttcaaaacat	aaatagcaga	960
	gcagttggca	aatgcccaag	atatgtaaaa	caggaaagt	tattattggc	aactgggatg	1020
5	aagaacgttc	ccgaaccttc	caaaaaaagg	aaaaaaagag	gcctgtttgg	tgctatagca	1080
	gggttttattg	aaaatggttg	ggaaggtctg	gtcgacgggt	ggtagcggtt	caggcatcag	1140
	aatgcacaag	gagaaggaac	tgacagcagc	tacaaaagca	cccaatcggc	aattgatcag	1200
	ataaccggaa	agttaaatat	actcattaag	aaaaccaacc	agcaatttga	gctaatagat	1260
	aatgaattca	ctgaagtggg	aaagcagatt	ggcaatttaa	ttaactggac	caaagactcc	1320
	atcacagaag	tatggtctta	caatgctgaa	cttcttggtg	caatggaaaa	ccagcacact	1380
10	attgatttgg	ctgattcaga	gatgaacaag	ctgtatgagc	gagtgaggaa	acaattaagg	1440
	gaaaatgctg	aagaggatgg	cactgggttc	tttgaaattt	ttcataaatg	tgacgatgat	1500
	tgtatggcta	gtataaggaa	caatacttat	gatcacagca	aatacagaga	agaagcgatg	1560
	caaaatagaa	tacaaattga	cccagtcaaa	ttgagtagtg	gctacaaaga	tgtagatact	1620
	tggttttagct	tccggggcatc	atgctttttg	cttcttgcca	ttgcaatggg	ccttggtttc	1680
15	atatgtgtga	agaacggaaa	catgcggtgc	actatttgta	tataggtttg	gaaaaaaaca	1740
	ccccctgttt	ctactcccc	ccaacttcgg	aggtcgacca	gtactccggg	cgaacttttg	1800
	tttttttttt	ttcccccgat	gctggaggtc	gaccagatgt	ccgaaagtgt	cccccccccc	1860
	cccccccccc	ggcgcggaac	ggcggggcca	ctctggactc	tttttttttt	tttttttttt	1920
	ttttttgggg	atcgccgct	agcttctgtt	ttggcggtatg	agagaagatt	ttcagcctga	1980
20	tacagattaa	atcagaacgc	agaagcggtc	tgataaaaca	gaatttgcct	ggcggcagta	2040
	gegcggtggg	cccacctgac	cccatgccga	actcagaagt	gaaacgccgt	agcgccgatg	2100
	gtagtggtgg	gtctccccat	gcgagagtag	ggaactgcc	ggcatcaaat	aaaacgaaag	2160
	gctcagtcga	aagactgggc	ctttcgtttt	atctgttgtt	tgctcggtga	cgctctcctg	2220
25	agtaggacaa	atccgcggg	agcggatttg	aacgttgcca	agcaacggcc	cggagggtgg	2280
	cgggcaggac	gcccgcata	aactgccagg	catcaaatta	agcagaaggc	catcctgacg	2340
	gatggccttt	ttgcgtttct	acaaactctt	ttgtttattt	ttctaaatac	attcaaatat	2400
	gtatccgctc	atgagacaat	aaccctgata	aatgcttcaa	taatattgaa	aaaggaagag	2460
	tatgagtatt	caacatttcc	gtgtcgccct	tattcccttt	tttgcgcat	tttgccctcc	2520
30	tgtttttgct	caccagaaa	cgctggtgaa	agtaaaagat	gctgaagatc	agttgggtgc	2580
	acgagtgggt	tacatcgaa	tggatctcaa	cagcggtaa	atccttgaga	gttttcgccc	2640
	cgaagaacgt	tttccaatga	tgagcacttt	taaagtctg	ctatgtggcg	cggtattatc	2700
	ccgtgttgac	gccgggcaag	agcaactcgg	tcgcccgcata	cactattctc	agaatgactt	2760
	ggttgagtac	tcaccagtca	cagaaaagca	tcttacggat	ggcatgacag	taagagaatt	2820
35	atgcagtgtc	gccataacca	tgagtgtata	cactgcggcc	aacttacttc	tgacaacgat	2880
	cgaggagccg	aaggagctaa	ccgctttttt	gcacaacatg	ggggatcatg	taactcgctt	2940
	tgatcggttg	gaaccggagc	tgaatgaagc	cataccaaac	gacgagcggt	acaccacgat	3000
	gcctgtagca	atggcaacaa	cgttgcgcaa	actattaact	ggcgaaactac	ttactctagc	3060
	ttcccggcaa	caattaatag	actggatgga	ggcgataaaa	ggtgcaggac	cacttctgctg	3120
40	ctcggccctt	ccggctgggt	ggtttatttg	tgataaatct	ggagccgggtg	agcgtgggtc	3180
	tcgcggtatc	attgcagcac	tggggccaga	tggtaaagcc	tcccgtatcg	tagttatcta	3240
	cacgacgggg	agtcaggcaa	ctatggatga	acgaaataga	cagatcgctg	agatagggtc	3300
	ctcactgatt	aagcattggt	aactgtcaga	ccaagtttac	tcatatatac	tttagattga	3360
	tttaaaactt	catttttaat	ttaaaaggat	ctagggtgaag	atcctttttg	ataatctcat	3420
45	gaccaaatac	ccttaacgtg	agttttcggt	ccactgagcg	tcagaccccg	tagaaaagat	3480
	caaaggatct	tcttgagatc	ctttttttct	gcgcgtaatc	tgctgcttgc	aaacaaaaaa	3540
	accaccgcta	ccagcggtgg	tttggttgcc	ggatcaagag	ctaccaactc	tttttccgaa	3600
	ggtaactggc	ttcagcagag	cgcagatacc	aaatactgtc	cttctagtgt	agccgtagtt	3660
	aggccaccac	ttcaagaact	ctgtagcacc	gcctacatac	ctcgctctgc	taatcctggt	3720
50	accagtggct	gctgccagtg	gcgataagtc	gtgtcttacc	gggttggaact	caagacgata	3780
	gttaccggat	aaggcgcagc	ggtcgggctg	aacggggggt	tcgtgcacac	agcccagctt	3840
	ggagcgaacg	acctacaccg	aactgagata	cctacagcgt	gagctatgag	aaagcgccac	3900
	gcttcccga	gggagaaaag	cggacaggtg	tccggtgaagc	ggcagggtcg	gaacaggaga	3960
	gcgcacgagg	gagcttccag	ggggaaacgc	ctgggtatctt	tatagtcctg	tcgggtttcg	4020
55	ccacctctga	cttgagcgtc	gatttttttg	atgctcgtca	ggggggcgga	gcctatggaa	4080
	aaacgccagc	aacgcggcct	ttttacggtt	cctggccctt	tgctggcctt	ttgctcacat	4140
	gttcttttct	gcgttatccc	ctgattcatt	aatgcagggtc	acgatccctt	ctggcgagtc	4200
	cccgctgcgga	gtcggagagc	gctccctgag	cgcgtgcggc	ccgagagggtc	gcgcctggcc	4260
	ggccttcggt	ccctcgtgtg	tcccggctcg	aggaggggccc	ggccgaaaat	gcttccggct	4320
60	cccgctctgg	agacacgggc	cggccccctg	cgtgtggcac	ggcgggccgg	gagggcgctc	4380
	cgggcccggc	gctgtctccc	cgtgtgtcct	ggggttgacc	agagggcccc	gggcgctccg	4440
	tgtgtggctg	cgatggtggc	gtttttgggg	acagggtgcc	gtgtccgtgt	cgcgctcgcc	4500

ctgggccggc ggcgtggctg gtgacgcgac ctcccggccc cgggggaggt atatctttcg 4560
 ctccgagtcg gcattttggg ccgcccgggtt attagtagaa acaggggtac 4610

5 <210> 7
 <211> 3558
 <212> DNA
 <213> Artificial Sequence

10 <220>
 <223> Description of Artificial Sequence: pHL2583

<400> 7

	tattagtaga	aacagggtat	tttttattct	agtacattac	gccccgcct	gccactcatc	60
15	gcagtactgt	tgtaattcat	taagcattct	gccgacatgg	aagccatcac	agacggcatg	120
	atgaacctga	atcgccagcg	gcacgacac	cttgctgcct	tgcgataaat	atttgcccat	180
	ggtgaaaacg	ggggcgaaag	agttgtccat	attggccacg	tttaaataca	aactggtgaa	240
	actcaccacg	ggattggctg	agacgaaaaa	catattctca	ataaaccctt	tagggaaata	300
	ggccagggtt	tcaccgtaac	acgccacatc	ttgcgaatat	atgtgtagaa	actgccggaa	360
20	atcgctcggtg	tattcactcc	agagcgatga	aaacgtttca	gtttgctcat	ggaaaacggg	420
	gtaacaagg	tgaacactat	cccatatcac	cagctcaccg	tctttcattg	ccatacggaa	480
	ttccggatga	gcattcatca	ggcgggcaag	aatgtgaata	aaggccggat	aaaacttggtg	540
	cttatttttc	tttacggtct	ttaaaaaggc	cgtaatatcc	agctgaacgg	tctggttata	600
	ggtacattga	gcaactgact	gaaatgcctc	aaaatgttct	ttacgatgcc	attgggatat	660
25	atcaacggtg	gtatatccag	tgattttttt	ctccatgatt	atggccatta	cccttgtttc	720
	tactcccccc	caacttcgga	ggtcgaccag	tactccgggc	gaaactttgt	tttttttttt	780
	tcccccgatg	ctggaggctg	accagatgtc	cgaaagtgtc	cccccccccc	cccccccccg	840
	gcgcggaacg	gcggggccac	tctggactct	tttttttttt	tttttttttt	tttttgggga	900
	tcggccgcta	gcttctggtt	tgggcgatga	gagaagatgt	tcagcctgat	acagattaaa	960
30	tcagaacgca	gaagcgggtc	gataaaaacag	aatltgcctg	gcggcagtag	cgcggtgtgc	1020
	ccacctgacc	ccatgccgaa	ctcagaagtg	aaacgccgta	gcgccgatgg	tagtgtgggg	1080
	tctccccatg	cgagagttag	gaactgccag	gcatacaata	aaacgaaagg	ctcagtcgaa	1140
	agactggggc	tttcggtttt	tctgttggtt	gtcgggtgaac	gctctcctga	gtaggacaaa	1200
	tccgcgggga	gcggatttga	acgttgcgaa	gcaacggccc	ggagggtggc	gggcaggacg	1260
35	cccgccataa	actgccaggc	atcaaatata	gcagaaggcc	atcctgacgg	atggcctttt	1320
	tgcgtttcta	caaactcttt	tgttttattt	tctaaatata	ttcaaatatg	tatccgctca	1380
	tgagacaata	accctgataa	atgcttcaat	aatattgaaa	aaggaagagt	atgagtattc	1440
	aacattttccg	tgtegccttt	attccctttt	ttgcggcatt	ttgccttctc	gtttttgctc	1500
	acccagaaac	gctggtgaaa	gtaaaagatg	ctgaagatca	gttgggtgca	cgagtgggtt	1560
40	acatcgaact	ggatctcaac	agcggtaaga	tccttgagag	ttttcgcccc	gaagaacggt	1620
	ttccaatgat	gagcactttt	aaagttctgc	tatgtggcgc	ggtattatcc	cgtgttgacg	1680
	ccgggcaaga	gcaactcggt	cgccgcatac	actattctca	gaatgacttg	gttgagtact	1740
	caccagtcac	agaaaagcat	cttacggatg	gcacgacagt	aagagaatta	tgacgtgctg	1800
	ccataaccat	gagtataaac	actgcggcca	acttacttct	gacaacgatc	ggaggaccga	1860
45	aggagctaac	cgcttttttg	cacaacatgg	gggatcatgt	aactcgcctt	gatcgttggtg	1920
	aaccggagct	gaatgaagcc	ataccaaacg	acgagcgtga	caccacgatg	cctgtagcaa	1980
	tggcaacaac	gttgcgcaaa	ctattaactg	gcgaactact	tactctagct	tcccggcaac	2040
	aattaataga	ctggatggag	gcggataaag	ttgcaggacc	acttctgcgc	tcggcccttc	2100
	cggctggctg	gtttattgct	gataaatctg	gagccggtga	gcgtgggtct	cgcggtatca	2160
50	ttgcagcact	ggggccagat	ggtaagccct	cccgtatcgt	agttatctac	acgacgggga	2220
	gtcaggcaac	tatggatgaa	cgaaatagac	agatcgctga	gatagggtgc	tcactgatta	2280
	agcattggta	actgtcagac	caagtttact	catatatact	ttagattgat	ttaaaacttc	2340
	atttttaatt	taaaaggatc	taggtgaaga	tcctttttga	taatctcatg	acaaaaatcc	2400
	cttaacgtga	gttttctgtc	cactgagcgt	cagaccccg	agaaaagatc	aaaggatctt	2460
55	cttgagatcc	tttttttctg	cgcgtaactc	gctgcttgca	aacaaaaaaa	ccaccgctac	2520
	cagcggtggt	ttgtttgccc	gatcaagagc	taccaactct	ttttccgaag	gtaactggct	2580
	tcagcagagc	gcagatacca	aatactgtcc	ttctagtgtg	gccgtagtta	ggccaccact	2640
	tcaagaactc	tgtagcaccg	cctacatacc	tcgctctgct	aatcctgtta	ccagtggctg	2700
	ctgccagtgg	cgataagtcg	tgtcttaccg	ggttgactc	aagacgatag	ttaccggata	2760
60	aggcgcagcg	gtcgggctga	acgggggggt	cgtgcacaca	gcccagcttg	gagcgaacga	2820
	cctacaccga	actgagatac	ctacagcgtg	agctatgaga	aagcgccacg	cttcccgaag	2880

```

ggagaaaggc ggacaggtat ccggtaaagc gcaggggtcgg aacaggagag cgcacgaggg 2940
agcttccagg gggaaacgcc tggatatctt atagtcctgt cgggtttcgc cacctctgac 3000
ttgagcgtcg atttttgtga tgctcgtcag gggggcggag cctatggaaa aacgccagca 3060
acgcggcctt ttacaggttc ctggcctttt gctggccttt tgctcacatg ttctttcctg 3120
5 cgttatcccc tgattcatta atgcaggtca cgatcctttc tggcgagtcg ccgtgcggag 3180
tcggagagcg ctccctgagc gcgtgcggcc cgagaggctg cgccctggccg gccttcggtc 3240
cctcgtgtgt cccggctcgt ggagggggcg gccgaaaatg cttccggctc ccgctctgga 3300
gacacggggc ggccccctgc gtgtggcacg ggcggccggg agggcgctcc cggccccggc 3360
ctgctcccgc gtgtgtcctg gggttgacca gagggccccg ggcgctccgt gtgtggctgc 3420
10 gatggtggcg tttttgggga caggtgtccg tgtccgtgtc gcgcgtcgcc tgggcccggc 3480
gcgtggtcgg tgacgcgacc tcccggcccc gggggaggtg tatctttcgc tccgagtcgg 3540
cattttgggc cgccgggt 3558

```

```

15 <210> 8
    <211> 4343
    <212> DNA
    <213> Artificial Sequence

```

```

20 <220>
    <223> Description of Artificial Sequence: pHL2989

```

```

<400> 8
25 ctttctggcg agtccccgtg cggagtcgga gagcgctccc tgagcgcgtg cggccccgaga 60
   ggtagcgcct ggccggcctt cggctccctc tgtgtcccgg tcgtaggagg ggccggccga 120
   aaatgcttcc ggctcccgtc ctggagacac gggccggccc cctgcgtgtg gcacgggccc 180
   ccgggagggc gtccccggcc cggcgtgtgt cccgcgtgtg tcctgggggt gaccagaggg 240
   ccccgggcgc tccgtgtgtg gctgcgatgg tggcggtttt ggggacaggt gtccgtgtcc 300
   gtgtcgcgcg tcgcctgggc cggcggcgtg gtcgggtgac cgacctcccg gccccggggg 360
30 aggtatatct ttcgctccga gtcggcattt tgggcccggc ggttattagt agaaacaggg 420
   tattttttat actagtaagc tcgaaggagt ccaccatgag taaaggagaa gaacttttca 480
   ctggagttgt cccaattctt gttgaattag atggtgatgt taatgggcac aaattttctg 540
   tcagtggaga ggggtgaagg gatgcaacat acggaaaact tacccttaaa tttatttgca 600
   ctactggaaa actacctgtt ccatggccaa cacttgtcac tactttcact tatggtgttc 660
35 aatgcttttc aagataccca gatcatatga aacagcatga ctttttcaag agtgccatgc 720
   ccgaagggtt tgtacaggaa agaactatat ttttcaaaga tgacgggaac tacaagacac 780
   gtgctgaagt caagtgtgaa ggtgataccc ttgttaatag aatcgagtta aaaggtattg 840
   atttttaaaga agatggaaac attcttgga acaaattgga atacaactat aactcacaca 900
   atgtatacat catggtgac aagcagaaga acggaatcaa ggccaacttc aagacccgcc 960
40 acaacatcga ggacggcggc gtgcagctgg ccgaccacta ccagcagaac acccaattg 1020
   gcgatggccc tgtcctttta ccagacaacc attacctgtc cacacaatct gccctttcga 1080
   aagatcccaa cgaaaagaga gaccacatgg tccttcttga gtttgtaaca gctgctggga 1140
   ttacacatgg catggatgaa ctatacaagg gatcccatca ccatcaccat cactaagctc 1200
   catggtctag atatctagta cattacgccc cgccctgcca ctcatcgag tactgttgta 1260
45 attcattaag cattctgccg acatggaagc catcacagac ggcagatga acctgaatcg 1320
   ccagcggcat cagcaccttg tcgccttgcg tataatat tt gccatggtg aaaacggggg 1380
   cgaagaagtt gtccatattg gccacgttta aatcaaaact ggtgaaactc acccagggat 1440
   tggcactcac aaagaacatg ttctcgatga atcctttagg gaagtaggcc aggttttcac 1500
   cgtaacacgc cacatcttgc gaatatatgt gtagaaactg ccggaaatcg tcgtggtatt 1560
50 cactccagag cgatgaaaac gtttcagttt gctcatggaa aacggtgtaa caagggtgaa 1620
   cactatccca tatcaccagc tcaccgtctt tcattgccat acggaattcc ggatgagcat 1680
   tcatcaggcg ggcaagaatg tgaataaagg ccggataaaa cttgtgctta ttttcttta 1740
   cggctcttaa aaaggccgta atatccagct gaacgggtctg gttataggta cattgagcaa 1800
   ctgactgaaa tgcctcaaaa tgttctttac gatgccattg ggatatatca acggtgggat 1860
55 atccagtgat tttttctctc atgattatgc aaaaaatacc cttgtttcta ctcccccca 1920
   acttcggagg tcgaccagta ctccgggcga aactttgttt ttttttttcc cccgatgct 1980
   ggaggtcgac cagatgtccg aaagtgtccc cccccccccc cccccccggc gcggaacggc 2040
   ggggccactc tggactcttt tttttttttt tttttttttt tttggggatc ggccgctagc 2100
   ttctgttttg gcggatgaga gaagattttc agcctgatac agattaaatc agaacgcaga 2160
60 agcggctctg taaaacagaa tttgcctggc ggcagtagcg cgggtggtccc acctgacccc 2220
   atgccgaact cagaagtga acgccgtage gccgatggta gtgtggggtc tccccatgcg 2280

```

	agagtaggga	actgccaggc	atcaaataaa	acgaaaggct	cagtcgaaaag	actgggcctt	2340
	tcgtttttatc	tgttggtttgt	cggtgaacgc	tctcctgagt	aggacaaatc	cgccgggagc	2400
	ggatttgaac	gttgcgaagc	aacggcccgc	agggtggcgc	gcaggacgcc	cgccataaac	2460
	tgccaggcat	caaattaagc	agaaggccat	cctgacggat	ggcctttttg	cgtttctaca	2520
5	aactccttttg	tttatttttc	taaatacatt	caaatatgta	tccgctcatg	agacaataac	2580
	cctgataaat	gcttcaataa	tattgaaaaa	ggaagagtat	gagtattcaa	catttccgtg	2640
	tcgcccttat	tccctttttt	gcggcatttt	gccttcctgt	ttttgctcac	ccagaaaacgc	2700
	tggtgaaaagt	aaaagatgct	gaagatcagt	tgggtgcacg	agtgggttac	atcgaactgg	2760
	atctcaacag	cggttaagatc	cttgagagtt	ttcgccccga	agaacgtttt	ccaatgatga	2820
10	gcactttttaa	agttctgcta	tgtggcgcg	tattatccc	tgttgacgcc	gggcaagagc	2880
	aactcggtcg	ccgcatacac	tattctcaga	atgacttggt	tgagtactca	ccagtcacag	2940
	aaaagcatct	tacggatggc	atgacagtaa	gagaattatg	cagtgtctgcc	ataaccatga	3000
	gtgataaacac	tgccggccaac	ttactttctga	caacgatcgc	aggaccgaag	gagctaaccg	3060
	ctttttttgca	caacatgggg	gatcatgtaa	ctcgccttga	tcgttgggaa	ccggagctga	3120
15	atgaagccat	accaaacgac	gagcgtgaca	ccacgatgcc	tgtagcaatg	gcaacaacgt	3180
	tgcgcaaact	attaactggc	gaactactta	ctctagcttc	ccggcaacaa	ttaatagact	3240
	ggatggaggc	ggataaagtt	gcaggaccac	ttctgcgtc	ggcccttccg	gctgggtggt	3300
	ttattgctga	taaatctgga	gccggtgagc	gtgggtctcg	cggtatcatt	gcagcactgg	3360
	ggccagatgg	taagccctcc	cgtatcgtag	ttatctacac	gacggggagt	caggcaacta	3420
20	tggatgaacg	aaatagacag	atcgctgaga	taggtgcctc	actgattaag	cattggtaac	3480
	tgtcagacca	agtttactca	tatatacttt	agattgattt	aaaacttcat	ttttaattta	3540
	aaaggatcta	ggtgaagatc	cttttttgata	atctcatgac	caaaatccct	taacgtgagt	3600
	tttcgttcca	ctgagcgtca	gaccccgtag	aaaagatcaa	aggatcttct	tgagatcctt	3660
	tttttctgcg	cgtaatctgc	tgcttgcaaa	caaaaaaacc	accgctacca	gcggtggttt	3720
25	gtttgccgga	tcaagagcta	ccaactcttt	ttccgaaggt	aactggcttc	agcagagcgc	3780
	agataccaaa	tactgtcctt	ctagtgtagc	cgtagttagg	ccaccacttc	aagaactctg	3840
	tagcaccgcc	tacatacctc	gctctgctaa	tcctgttacc	agtggctgct	gccagtggcg	3900
	ataagtcgtg	tcttaccggg	ttggactcaa	gacgatagtt	accggataag	gcgagcggt	3960
	cgggctgaac	gggggggttcg	tgcacacagc	ccagcttgga	gcgaacgacc	tacaccgaac	4020
30	tgagatacct	acagcgtgag	ctatgagaaa	gcgccacgct	tcccgaagg	agaaaggcgc	4080
	acaggatatcc	ggtaagcggc	agggtcgga	caggagagcg	cacgagggag	cttccagggg	4140
	gaaacgcctg	gtatctttat	agtcctgtcg	ggtttcgcca	cctctgactt	gagcgtcgat	4200
	ttttgtgatg	ctcgtcagg	gggcggagcc	tatggaaaaa	cgccagcaac	gcggcctttt	4260
	tacggttcct	ggccttttgc	tggccttttg	ctcacatggt	ctttcctgcg	ttatccctg	4320
35	attcattaat	gcagggtcacg	atc				4343

<210> 9

<211> 3888

40 <212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: pHL1920

45

<400> 9

	cccaaaaaaa	aaaaaaaaaa	aaaaaaaaaag	agtcacagagt	ggccccgcgc	ttccgcgcgc	60
	gggggggggg	ggggggggga	cacttttcgga	catctggtcg	acctccagca	tcggggggaaa	120
	aaaaaaaaaac	aaagttttcgc	ccggagtact	ggtcgacctc	cgaagtggg	ggggagtaga	180
50	aacagggtag	ataatcactc	actgagtgc	atccacatcg	cgagcgcgcg	taatacgact	240
	cactatagg	cgaattgggt	accgggcccc	ccctcgaggt	cgacgggtatc	gataagcttc	300
	gacgagattt	tcaggagcta	aggaagctaa	aattggagaaa	aaaatcactg	gatataccac	360
	cgttgatata	tcccaatggc	atcgtaaaga	acattttgag	gcatttcagt	cagttgctca	420
	atgtacctat	aaccagaccg	ttcagctgga	tattacggcc	tttttaaaga	ccgtaaagaa	480
55	aaataagcac	aagttttatc	cggcctttat	tcacattctt	gcccgcctga	tgaatgctca	540
	tccggaattc	cgtatggcaa	tgaaagacgg	tgagctgggtg	atatgggata	gtgttcaccc	600
	ttgttacacc	gttttccatg	agcaaaactga	aacgttttca	tcgctctgga	gtgaatacca	660
	cgacgatttc	cggcagtttc	tacacatata	ttcgcaagat	gtggcgtggt	acggtgaaaa	720
	cctggcctat	ttccctaaag	ggtttattga	gaatatgttt	ttcgtctcag	ccaatccctg	780
60	ggtgagtttc	accagttttg	atttaaactg	ggccaatatg	gacaacttct	tcgccccctg	840
	tttcaccatg	ggcaaatatt	atacgcaagg	cgacaagggtg	ctgatgccgc	tggcgattca	900

	ggttcatcat	gcggtttgtg	atggcttcca	tgtcggcaga	atgcttaatg	aattacaaca	960
	gtactgcat	gagtggcagg	gcggggcgta	atTTTTTTaa	ggcagttatt	ggtgccctta	1020
	aacgcctggt	gctacgcctg	aataagtgat	aataagcgga	tgaatggcag	aaattcgtcg	1080
	aagcttgata	tcgaattcct	gcagcccggg	ggatccacta	gttctagagc	ggccgccacc	1140
5	gcggtggagc	tccagctttt	gttcccttta	gtgagggtta	attgcgcgca	ggcctagcta	1200
	ggtaaagaaa	aatacccttg	attcttctaa	taaccggcg	gccccaaatg	ccgactcgga	1260
	gcgaaagata	tacctcccc	ggggccggga	ggtcgcgtca	ccgaccacgc	cgccggccca	1320
	ggcgacgcgc	gacacggaca	cctgtcccca	aaaacgccac	catcgagcc	acacacggag	1380
	cgcccgggc	cctctgggtca	accccaggac	acacgcggga	gcagcgccgg	gcccggggacg	1440
10	ccctcccgcc	cgcccggtgcc	acacgcaggg	ggccggcccg	tgtctccaga	gcgggagccg	1500
	gaagcatttt	cgcccggtccc	ctcctacgac	cgggacacac	gagggaccga	aggccggcca	1560
	ggcgcgacct	ctcgggccgc	acgcgcgctc	agggagcgct	ctccgactcc	gcacggggac	1620
	tcgccagaaa	ggatcgtgac	ctgcattaat	gaatcagggg	ataacgcagg	aaagaacatg	1680
	tgagcaaaaag	gccagcaaaa	ggccaggaac	cgtaaaaagg	ccgcgttgct	ggcgtttttc	1740
15	cataggctcc	gccccctga	cgagcatcac	aaaaatcgac	gctcaagtca	gaggtggcga	1800
	aacccgacag	gactataaag	ataccaggcg	tttccccctg	gaagctccct	cgtgcgtctc	1860
	cctgtttccga	ccctgccgct	taccggatgc	ctgtccgctc	ttctcccttc	gggaagcgtg	1920
	gcgctttctc	atagctcacg	ctgtaggtat	ctcagttcgg	tgtaggtcgt	tcgctccaag	1980
	ctgggctgtg	tgcacgaacc	ccccgttcag	ccgcaccgct	gcgccttatc	cggttaactat	2040
20	cgtcttgagt	ccaacccggt	aagacacgac	ttatcgccac	tggcagcagc	cactggtaac	2100
	aggattagca	gagcgaggtg	tgtaggcggt	gctacagagt	tcttgaagtg	gtggcctaac	2160
	tacggctaca	ctagaaggac	agtatttggt	atctgcgctc	tgctgaagcc	agttaccttc	2220
	ggaaaaagag	ttggtagctc	ttgatccggc	aaacaaacca	ccgctggtag	cggtggtttt	2280
	tttgtttgca	agcagcagat	tacgcgcaga	aaaaaaggat	ctcaagaaga	tcctttgatc	2340
25	ttttctacgg	ggtctgacgc	tcagtggaac	gaaaactcac	gttaagggat	tttggctcatg	2400
	agattatcaa	aaaggatctt	cacctagatc	cttttaaatt	aaaaatgaag	ttttaaatca	2460
	atctaaagta	tatatgagta	aacttggctc	gacagttacc	aatgcttaat	cagtgaggca	2520
	cctatctcag	cgatctgtct	atttcgttca	tccatagttg	cctgactccc	cgtcgtgtag	2580
	ataactacga	tacgggaggg	cttaccatct	ggccccagtg	ctgcaatgat	accgcgagac	2640
30	ccacgctcac	cggtctccaga	tttatcagca	ataaaccagc	cagccggaag	ggccgagcgc	2700
	agaagtggtc	ctgcaacttt	atccgcctcc	atccagctca	ttaattgttg	ccgggaagct	2760
	agagtaagta	gttcgccagt	taatagtttg	cgcaacgttg	ttgccattgc	tacaggcatc	2820
	gtggtgtcac	gctcgtcgtt	tggtaggtct	tcattcagct	ccggttccca	acgatcaagg	2880
	cgagttacat	gatcccccat	gttgtgcaaa	aaagcggtta	gctccttcgg	tcctccgatc	2940
35	gttgtcagaa	gtaagttggc	cgcagtgtta	tactcatggt	ttatggcagc	actgcataat	3000
	tctcttactg	tcattgccatc	cgtaagatgc	ttttctgtga	ctggtgagta	ctcaaccaag	3060
	tcattctgag	aatagtgtat	gcggcgaccg	agttgtctct	gcccggcgctc	aacacgggat	3120
	aataccgcgc	cacatagcag	aactttaaaa	gtgctcatca	ttggaaaacg	ttcttcgggg	3180
	cgaaaactct	caaggatctt	accgctgttg	agatccagtt	cgatgtaacc	cactcgtgca	3240
40	cccaactgat	cttcagcatc	ttttactttc	accagcgttt	ctgggtgagc	aaaaacagga	3300
	aggcaaaatg	ccgcaaaaaa	gggaataagg	gcgacacgga	aatggtgaat	actcatactc	3360
	ttcctttttc	aatattattg	aagcatttat	caggggttat	gtctcatgag	cggatacata	3420
	tttgaatgta	tttagaaaaa	taaacaaaag	agtttgtaga	aacgcaaaaa	ggccatccgt	3480
	caggatggcc	ttctgcttaa	ttttagtgcct	ggcagtttat	ggcgggcgctc	ctgcccggcca	3540
45	ccctccgggc	cgttgcttcg	caacgttcaa	atccgctccc	ggcggtattg	tcctactcag	3600
	gagagcgttc	accgacaaac	aacagataaa	acgaaaggcc	cagtcttttcg	actgagcctt	3660
	tcgtttttat	tgatgcctgg	cagttcccta	ctctcgcagc	gggagacccc	acactaccat	3720
	cggcgctacg	gcgtttcact	tctgagttcg	gcatggggtc	aggtgggacc	accgcgctac	3780
	tgccgccagg	caaattctgt	tttatcagac	cgcttctgcg	ttctgattta	atctgtatca	3840
50	ggctgaaaaat	cttctctcat	ccgcaaaaac	agaagctagc	ggccgatc		3888

<210> 10

<211> 12

55 <212> RNA

<213> Influenza A virus

<400> 10

ccugcuuuug cu

60

12

WO 00/53786

PCT/EP00/01903

13

- 5 <210> 11
<211> 12
<212> RNA
<213> Influenza B virus

<400> 11
nnygcuucug cu 12
- 10 <210> 12
<211> 12
<212> RNA
<213> Influenza C virus
- 15 <400> 12
ccugcuucug cu 12
- 20 <210> 13
<211> 12
<212> RNA
<213> Artificial Sequence
- 25 <220>
<223> Description of Artificial Sequence: Modified
influenza A 3' sequence (pHL1104 and 1920)

<400> 13
ccuguuucua cu 12
- 30
- 35 <210> 14
<211> 12
<212> RNA
<213> Artificial Sequence
- 40 <220>
<223> Description of Artificial Sequence: Modified
influenza A 3' sequence (pHL1948)

<400> 14
ccucguucuc cu 12
- 45
- 50 <210> 15
<211> 13
<212> RNA
<213> Artificial Sequence
- 55 <220>
<223> Description of Artificial Sequence: Modified
influenza A 5' sequence (pHL1920)

<400> 15
agaagaauca agg 13
- 60 <210> 16
<211> 13
<212> RNA
<213> Influenza A virus

<400> 16
 aguagaaaca agg 13

5

<210> 17
 <211> 13
 <212> RNA
 <213> Influenza B virus

10

<400> 17
 aguagwaaca rnn 13

15

<210> 18
 <211> 13
 <212> RNA
 <213> Influenza C virus

20

<400> 18
 agcaguagca agr 13

25

<210> 19
 <211> 21
 <212> RNA
 <213> Influenza A virus

30

<400> 19
 aguagaaaca aggnnnuuuu u 21

35

<210> 20
 <211> 21
 <212> RNA
 <213> Artificial Sequence

40

<220>
 <223> Description of Artificial Sequence: Modified
 influenza A 5'-sequence (pHL1920)

45

<400> 20
 agaagaauca aggnnnuuuu u 21

50

<210> 21
 <211> 21
 <212> RNA
 <213> Influenza B virus

55

<400> 21
 aguagwaaca rnnnnuuuu u 21

60

<210> 22
 <211> 19
 <212> RNA
 <213> Artificial Sequence

60

<220>
 <223> Description of Artificial Sequence: Modified

influenza C 5' sequence

5 <400> 22
 aguaguaaca agrguuuuu 19

 <210> 23
 <211> 15
 <212> RNA
 10 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Modified
 influenza A 3' sequence (pHL1104 and 1920)

15 <400> 23
 nnnccucuuu cuacu 15

20 <210> 24
 <211> 15
 <212> RNA
 <213> Artificial Sequence

25 <220>
 <223> Description of Artificial Sequence: Modified
 influenza A 3' sequence (pHL1948)

30 <400> 24
 nnnccucguu cuccu 15

35 <210> 25
 <211> 15
 <212> RNA
 <213> Artificial Sequence

40 <220>
 <223> Description of Artificial Sequence: Modified
 influenza B 3' sequence

45 <400> 25
 nnnnnyguuu cuacu 15

50 <210> 26
 <211> 14
 <212> RNA
 <213> Artificial Sequence

55 <220>
 <223> Description of Artificial Sequence: Modified
 influenza C 3' sequence

 <400> 26
 ccccuguuuc uacu 14